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THE PAN-PACIFIC ENTOMOLOGIST

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October, 1949

THE IDENTITY OF *HEMITRIOZA WASHINGTONIA* KLYVER AND *APHALARA PUNCTELLUS* VAN DUZEE

(Homoptera: Psyllidae)

By D. D. JENSEN

University of California, Berkeley

Klyver (1930) described as *Hemitrioza washingtonia* a single male psyllid collected at Toppenish, Washington. The writer has examined this specimen, mounted on a slide, in the collection of Stanford University. It proves to be a species of *Calophya* rather than *Hemitrioza* and is typical of the genus in all of its characters. It is readily distinguishable from *Hemitrioza* by the very large and conspicuous pterostigma, by other venational characters and by the very short antennae. *Hemitrioza sonchi* Crawford still remains the only species known in that genus.

Of the previously described species of *Calophya*, *C. washingtonia* is most closely related to *C. nigripennis* (Riley). The bright yellow thorax and genal processes of *nigripennis*, however, serve to distinguish it readily from *washingtonia* which, according to Klyver, is uniform medium brown over the entire body. A species closely related to *washingtonia* has been collected by the writer in southern California and will be described in a later paper.

Van Duzee (1923) described as new, three species of psyllids (*Aphalara mera*, *A. punctellus*, and *A. nupera*) collected by the Expedition of the California Academy of Sciences to the Gulf of California. The writer (1945) reported that the species described as *A. mera* is *Heteropsylla texana* Crawford.

Recent examination of the other two species described by Van Duzee revealed that *nupera* was placed correctly in *Aphalara* where it resembles *A. pulchella* Crawford, and that *punctellus* is a synonym of *Aphalaroida inermis* Crawford.

The following comments are given to supplement the descriptions published for this species by Crawford and by Van Duzee. The body does not have conspicuous glandular hairs except on the distal portions of the vertex and a few on the pleuron in front of the wings. The proctiger of the male genitalia is 0.34 mm.

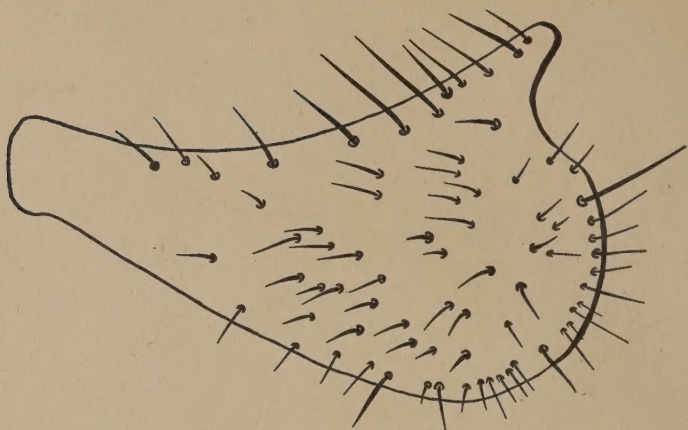


Fig. 1. *Aphalaroida inermis* Crawford. Inner surface of male forcep.

long, simple, straight, with the margins converging slightly toward the rounded apex. Most of the basal two-thirds of the anterior face of the proctiger is bare. The distal portion is covered with short but dense pubescence. The forceps are approximately one-half as long as the proctiger and somewhat pyriform in lateral view (Fig. 1), the caudal margin being convexly rounded and the cephalic margin concave in outline. The apex is broadly rounded except for the anterior portion which is produced cephalad and slightly mesad as a thumb-like lobe. The medial portion of the apex bears a narrow, medially produced flange on the inner face. Setae are sparse on the outer surface, but common and conspicuous on the mesal face of the forceps, the largest arising primarily near the cephalic margin.

LITERATURE CITED

- JENSEN, D. D. 1945. Notes on the synonymy, nymphs and distribution of *Heteropsylla texana* Crawford. Pan-Pac. Ent. 21:74-76.
- KLYVER, F. D. 1931. New records and two species of Chermidae from British Columbia and Washington, with biological notes. Pan-Pac. Ent. 8:11-17.
- VAN DUZEE, E. P. 1923. Expedition of the California Academy of Sciences to the Gulf of California in 1921. (The Hemiptera). Proc. Calif. Acad. Sci., (4) 12:199-200.

R SUBSPECIFIC NAMES FOR TWO COMMON PACIFIC COAST ANDRENA

(Hymenoptera: Andrenidae)

BY URLESS N. LANHAM

Department of Zoology, University of Michigan

Collectors on the Pacific Coast have long recognized that the representative of *Andrena cressonii* Robertson found there differed from the typical form, the almost complete lack of tergal hair bands in both sexes giving it an appearance very different from that of the eastern *cressonii*. Several names have been applied to *A. cressonii*, but none of these can be used as a subspecific name for the far western form. The type localities of these are from the Rocky Mountains eastward, and, although two (*bridwelli* Cockerell and *dubia* Robertson) represent variations which have face markings in the male approaching the condition which is normal in the Pacific Coast form, the characteristically infasciate condition of the terga of the latter is not found in unworn eastern specimens.

Andrena cressonii infasciata Lanham, new subspecies

Female. Like typical *cressonii*, but differing in the following details: only short lateral patches of hair present on terga 2-4, although 4 with a very sparse band of hair medially; clypeus duller, more coarsely reticulate, punctures near middle more closely crowded.

Length, approximately 10 mm.; anterior wing, 8.5 mm.

Male. Terga without apical hair bands; sculpture of frons coarser than in typical *cressonii*; clypeus with entire apical margin black, lower margin of yellow not neatly defined at middle of clypeus as in typical *cressonii*, lateral yellow face marks not nearly reaching to bases of antennae, only about one-third as large as in typical *cressonii*.

Length, approximately 9 mm.; anterior wing 7 mm.

Holotype, female (Calif. Acad. Sci., Ent. No. 6132): 4 mi. N. W. ORINDA, CALIF., 27 March, 1948, *Brassica* (C. C. and U. N. Lanham). *Allotype*, male (Calif. Acad. Sci., Ent. No. 6133): same data as holotype. *Paratypes*: 3 females, 3 males, same data as holotype (except one male from *Salix*); Berkeley, Calif., 11 March, 1947, *Brassica*, 1 female (J. W. MacSwain), 27-30 March, 1948, 1 female, 8 males (P. D. Hurd, U. N. Lanham), 6 April, 1948, *Brassica*, 2 males, (P. D. H.), 16 May, 1948, *Pyracantha*,

1 female (P. D. H.); 8 mi. E. of Pinole, Calif., 23 March, 1947, swept from mixed *Brassica* and *Ranunculus*, 19 females, 6 males (P. D. Hurd, C. C. and U. N. Lanham); Saranap, Calif., 20 March, 1948, 1 female, 6 males (U. N. L.); Danville, Calif., 20 March, 1948, 14 males (U. N. L.). All of these localities are on the east side of San Francisco Bay; some are east of the Berkeley Hills. Additional specimens, not included in the paratype series, are from the following localities: Black's Mtn., Lassen Co., Calif., 13 June, 1941, 2 females (P. D. H.); Big Spring, Shasta Co., Calif., 23 May, 1941, 1 female; Yosemite Valley, Calif., 16 June, 1935, 1 female (E. G. Linsley). I have seen specimens referable to this subspecies from Riverside, California and Washington State; the extent of its range eastward is not known to me at present.

A. cressonii infasciata appears to be of somewhat larger average size than *cressonii* from Illinois. There is some variation in the development of the tergal bands, but the present subspecies almost never has the hair band on tergum 3 even approaching completeness, while it is usually complete in females of the typical form. The entire apical margin of the clypeus is black in all males of the paratype series of *A. c. infasciata*, and one male (not styloized) lacks yellow face marks entirely; other specimens show intermediate degrees of loss of face markings. The rather uncommon eastern *A. dubia* Robertson and *A. bridwelli* Cockerell have the face with yellow markings similarly restricted (apical margin of clypeus black); since these names were based on male specimens, and no constantly differing females have been recognized in the eastern fauna, at present it seems best to regard these as synonyms of *cressonii* Robertson. Conclusive evidence of neither geographic races nor sibling species has yet been demonstrated in *cressonii* from the Rocky Mountains eastward. Because of the appreciable amount of convergent variability in the eastern and western forms, the lack of differences in the male genitalia, and the fact that they are apparently allopatric, *infasciata* is given only subspecific rank. *A. cressonii cressonii* has been seen from Boulder, Colorado, and the Atlantic Coast near Washington, D. C.; the type locality is Carlinville, Illinois.

Andrena osmioides benitonis Lanham, new subspecies

This is a dark form of *osmioides*, in which the hairs of the head are mostly black, instead of all white, as in the typical form.

Female. Like nominate *osmioides*, except for the following differences in coloration of the pubescence: hair of head dark brownish-black, except that hairs about bases of antennae are somewhat lighter, although dusky; some dusky hairs at sides of propodeum; hairs of all segments of front legs black, hind tibial scopa black.

Length, approximately 11 mm.; anterior wing, 9.5 mm.

Male. Appears to be exactly like nominate *osmioides*, except that there are a few dusky hairs at the extreme lateral margins of the face. Length, about 9.5 mm.; anterior wing, 7.5 mm.

Holotype, female (Calif. Acad. Sci., Ent. No. 6134): PINNACLES NATIONAL MONUMENT, SAN BENITO CO., CALIF., 24 April, 1948, *Cryptantha* (P. D. Hurd). *Allotype*, male (Calif. Acad. Sci., Ent. No. 6135): same data as holotype. *Paratypes*: 1 female, 2 males, same data as holotype; Pinnacles, Calif., 25 March, 1940, *Cryptantha*, 5 females (E. G. Linsley); Jamesburg, Monterey Co., Calif., 22 March, 1940, 16 females (E. G. Linsley). Additional specimens referable to this subspecies, but not included in the paratype series, are 18 females from San Antonio Valley, Santa Clara Co., Calif., 20 April, 1948 (Ray F. Smith).

This subspecies is a more northern representative of *osmioides*, the typical form having been described from Claremont, California. Numerous individuals from Riverside, California, all had the pubescence of the head entirely white. There is slight variation in coloration in the paratype series of *A. o. benitonis*, an occasional specimen having nearly white hairs on the front femora or having the scopal hairs more or less white. The series from San Antonio Valley, approximately 75 miles north of the type locality of *benitonis*, are uniformly with dark heads and legs, and perhaps have the lower pleural hairs darker than do the Pinnacles or Jamesburg specimens. Three specimens of *osmioides* seen from the region north of San Francisco Bay indicate that the form occupying that area may be one which continues the trend to dark coloration northward, since they had not only the hair of the head and legs, but also that of the pleura black. Very few specimens have been seen from the western foothills of the Sierras, on the eastern edge of the Central Valley, but a single female from Auburn, Placer Co., Calif., has only a few black hairs on the face, and the pubescence elsewhere has a strong reddish tinge; it is possible that another subspecies occupies this area.

I am indebted to the authorities in charge of the California Insect Survey collection at the University of California, Berkeley, for the loan of material; paratypes of the new subspecies are to be found in that collection.

A SOUTH AMERICAN SPECIES OF BUPRESTIDAE
TAKEN IN CALIFORNIA

(Coleoptera)

By W. J. CHAMBERLIN

Oregon State College, Corvallis

Among some beetles recently submitted for determination was a very striking specimen belonging to the genus *Chrysobothris*. Being quite familiar with practically all indigenous species belonging to this genus and being unable to recognize the species and finding that it did not fit into either Horn's or Fisher's key, the specimen was sent to Dr. E. C. Van Dyke. He reports the specimen to be *Chrysobothris amabilis* Lap. & Gory which is known from Brazil, Venezuela and Guiana in South America.

The species has not previously been reported from the United States and was probably introduced in wood from South America.

The specimen is labeled San Bernardino, California (Insectary) 23 December 1941. Ed Appel.

The species somewhat resembles *C. geminata* Lec. but is smaller (Length 16.5 mm.) clypeus faintly, broadly emarginate; thorax smooth, coppery green with coppery red triangular splotches at the humeri; elytra shining greenish blue with the fovea near the base deep, nearly circular and brilliant green, similar foveae more shallow and slightly larger near center of each elytron; posterior foveae divided into two brilliant green irregular spots. Elytra widest near the humeral angles with a green spot and coarsely serrate more than one-third from the tips which are separately prolonged into a spine; each elytron with one very evident costa extending from tip of elytron nearly one-half to base. Shining green beneath; tibia and extremities of femora coppery red. Last ventral (evidently a female) edges entire, neither interrupted nor serrate. A very evident narrow, high, keel, or carina extends from the margin to the base, less elevated near the latter. Posterior margin with deep serration somewhat similar to *C. aerea* Chev. (Horn, 1886, fig. 176).

REFERENCE

- HORN G. H. 1886. A monograph of the species of *Chrysobothris* inhabiting the United States. Trans. Amer. Ent. Soc. 13:65-124, plates II-VII, figs. 1-247.

A NEW APHID ON LETTUCE

(Homoptera)

By E. O. ESSIG

University of California, Berkeley

A yellowish-green aphid was collected in large numbers from the flowering stalks and seed heads of cultivated lettuce, *Lactuca sativa* L., at Parma, Idaho, September 25, 1947 and July 23, 1948, by Dr. H. C. Manis and Professor W. F. Barr of the University of Idaho, who furnished all of the specimens herein described. Dr. H. C. Manis reports that these may be the same as the unknown species of aphid which caused rather severe damage to seed lettuce in the Parma region in 1927. The 1949 infestation is considerably less than those of 1947 and 1948.

Since receiving these specimens reports of this same species have been received from Professor Miriam A. Palmer, who reported a heavy infestation on lettuce in her garden at Boulder, Colorado, in October, 1947. The Colorado specimens were compared with specimens collected in Idaho and are the same species.

Dr. F. C. Hottes has also reported receiving specimens of the same species from Dr. Herbert H. Ross, Illinois Natural History Survey, Urbana, Illinois, who collected them on lettuce in that state in July or September, 1948.

***Macrosiphum barri* Essig, new species**

(Fig. 1)

Alate viviparous female. Type. Head, thorax, antennae, black excepting bases of IV, V, and VI, which are pale; tips of femora, tibiae, and all of the tarsi, black. Knobbed hairs on abdomen as illustrated. Antennae with 13-13 circular sensoria nearly in a straight line on segment III. Length of segments: III, 0.57 mm.; IV, 0.38 mm.; V, 0.33 mm.; VI, 0.61 mm.; (base 0.15 mm. - 0.46 mm.). Cornicles cylindrical, somewhat enlarged at base and apically; slightly reticulated and constricted near tip. Arrangement of spines on head, antennae, and genital plate; on the rostrum; and base of the hind leg as indicated in the enlarged drawing. Wings with veins slightly pigmented close to margins; radial sector sharply curved and not extending to tip of wing; 2nd fork of media about midway from base to tip of wing.

Apterous viviparous female. Paratype. Pale yellowish or greenish throughout; rather slender; with short, curved, knobbed hairs arranged in 6 rows on the dorsum and a marginal row on each

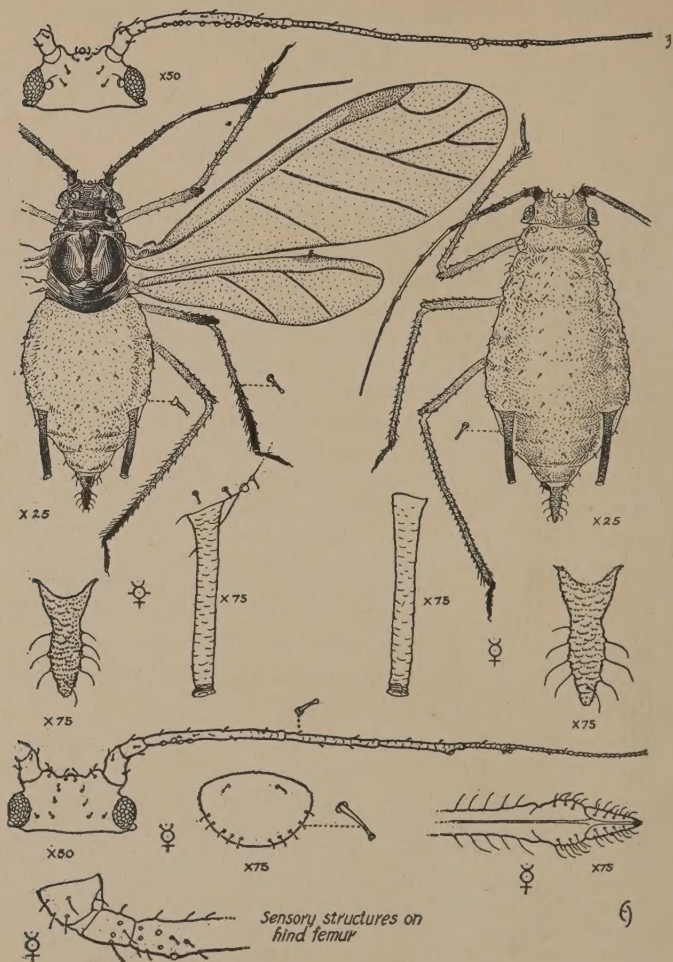


Fig. 1—*Macrosiphum barri* Essig. Alate and apterous viviparous females with details of heads, cornicles, setae, caudas, rostrum, anal plate, and base of hind leg of apterous female.

(Drawing by Frieda Abernathy).

side of the abdomen and a few also on the antennae. Antennal segments I, II, III, tips of IV and V, and all of VI; the cornicles, cauda, and tarsi dusky; lateral tubercles on prothorax and abdomen. Arrangement of spines and sensoria on head and antennae as shown in enlarged drawing. Segment III of antenna with 3 to 5 circular sensoria in a row on basal half (see Figure 1). Length of antennal segments: III, 0.54 mm.; IV, 0.34 mm.; V, 0.31 mm.; VI, 0.61 mm.; (base 0.15 mm. + unguis, 0.46 mm.). Cornicles nearly cylindrical, wide at bases, with flaring rim, somewhat reticulated near tips; length 0.46 mm. Cauda relatively slender, base swollen, tapering to a narrower median constriction, pointed; with about 8 hairs; length 0.32 mm.

Length of body 2 mm.

The type and 22 other alates and 22 apterae were studied and are preserved in diaphane on 15 glass microscopic slides. The type and certain paratypes are in the author's collection. Paratypes have also been presented to Professor Barr, University of Idaho, to the U. S. National Museum and to the California Academy of Sciences.

This species appears to be quite distinct from related species in this country and elsewhere.

From *Macrosiphum dirhodum* (Walker) it may be separated by the relatively shorter antennal segments, more secondary sensoria in the apterae and fewer in the alates and also by longer rostral hairs. It differs from *M. scariola* (Nevsky) (*Acyrtosiphon*) by the darker appendages and fewer sensoria in all forms and by the longer cauda.

Paratypes show considerable variation in the number of secondary sensoria in the alatae: from 11-17, and in the apterae: from 2-8. In the latter, the sensoria appear to divide into two as often shown by 3 on one side and 6 on the other.

A NEW SPECIES OF STIZOCERA FROM FLORIDA

(Coleoptera: Cerambycidae)

BY E. GORTON LINSLEY

University of California

Gounelle has broadened and redefined *Stizocera* Serville to include a number of species which differ from the genotype in having the pronotum more or less tuberculate laterally. The following is a *Stizocera* in the sense of Gounelle.

Stizocera floridana Linsley, new species

Female: Form elongate, narrow, subcylindrical, slightly flattened above; surface polished, pale rufo-testaceous, elytra testaceous, eyes black. Head very sparsely punctate, nearly glabrous, a fine longitudinal groove between antennal tubercles; antennae extending a little more than two segments beyond apex of elytra, segments three to eight or nine finely, longitudinally carinate, three to seven or eight spinose at apex, the spines stout, prominent, diminishing gradually in length, scape 3.4 x as long as broad, a little shorter than third segment (8.5:9.5), second segment one and one-half times as long as broad, subequal in width at base and apex, sides obtusely tuberculate at middle, dorsal surface with a pair of rounded subbasal tubercles; integument almost impunctate, with a few scattered long erect hairs, especially at sides; scutellum very finely, inconspicuously pubescent, the pubescence denser along posterior margin; prosternum deeply transversely impressed at middle, convex anteriorly, intercoxal process narrow between the coxae, arcuately declivous, apex expanded and emarginate. Elytra more than three and one-half times as long as pronotum, nearly three and one-half times as long as basal width; surface sparsely, irregularly punctate on disk, more densely at sides, with scattered, suberect yellowish hairs; apices separately emarginate, bispinose, outer spine longer and more definitely spiniform.

Legs elongate, sparsely clothed with long, suberect pale hairs; femora abruptly clavate and pedunculate, intermediate pair obtusely bidentate at apex, posterior pair acutely bidentate or subspinose at apex; tibiae longitudinally carinate. Abdomen almost impunctate, with a few scattered suberect hairs; fifth sternite broadly truncate at apex. Length 13 mm., breadth 2.7 mm.

Type, female. Morco, Florida, April 17, 1912, and one paratype, female, April 15, 1912, both in the collection of the American Museum of Natural History.

This is the first species of *Stizocera* known from the United States, although five species are known from the West Indies including one each from the Cayman Islands, Jamaica, Haiti, and Puerto Rico. The present species is more closely related to the West Indian forms than to those now known from Mexico. From *insulana* (Gahan) and *caymanensis* Fisher it differs in having the tibiae carinate, from *vanzwaluwenburgi* Fisher in the elongate pronotum, short elytral spines, and from all three species in the arrangement of the dorsal pronotal callosities. *S. dozieri* Fisher and *S. poeyi* Chevr. are differently colored and otherwise distinct from *floridana*.

A SYNOPSIS OF NORTH AMERICAN ANAPHOIDEA

(Hymenoptera: Mymaridae)

BY RICHARD L. DOUTT¹*Division of Biological Control, University of California*

The mymarid genus *Anaphoidea* is probably of cosmopolitan distribution for species have been described from Europe, Africa, Australia, North America, and the West Indies. Two species have been utilized in biological control projects, and an appreciable reduction in the numbers of the eucalyptus weevil, *Gonipterus scutellarius* Gyll., followed the introduction of *Anaphoidea nitens* into South Africa from Australia (Clausen, 1940).

The published host records confined the genus to species of weevils until Bakkendorf (1934) reared *A. conotracheli* (Girault) from the eggs of a Chrysomelid and also from the eggs of a Dytiscid, *Agabus* sp. An entirely new host record, which extends the host range of the genus to the Hemiptera (*Gerris* sp.) is introduced in this paper.

Recent collections made in California indicate that the genus is by no means an uncommon element in the faunal pattern of the pacific slope, and four new species are described herein.

***Anaphoidea conferta* Doutt, new species**

Female. Length 0.55 mm. General body color very dark brown. Eyes fuscous. Trochanters, femora, tibiae, tarsi except metatarsal segments pallid testaceous; metatarsi darker. Forewings fumated except for clear area extending longitudinally through wing blade center, expanding distally. Another clear area beneath anterior portion of venation. Posterior wings fumated, slightly maculate.

Antennae inserted high on face. Structure as in Fig. 1. Scape strongly convex ventrally. Pedicel half length of scape. Funicle unusual for genus, segments short, subglobular to quadrate. Funicle segment 1 small, subglobular. Funicle 3 largest funicle segment, a third longer than wide, longer and broader than segment 2. Funicle segment 4 wider than long. Funicle segments 5, 6 slightly longer than wide, subequal to segment 3. Club longer than last 3 funicle segments considered together; nearly twice funicle width. Club divided, distal segment longer than basal segment.

¹Assistant Entomologist in the Agricultural Experiment Station.

Head about as wide as long, without distinct sculpturing. Sparsely covered with setae, alveoli pallid, conspicuous.

Thorax normal for genus, mostly smooth; faint reticulation on parapsides and scutum. Faint striations on scutellum. Parapsidal sutures distinct.

Forewings as in Fig. 2. Relatively long considering body size. Longest marginal cilia somewhat longer than greatest wing width. About 10 lines of discal cilia at greatest wing width. Posterior wings with complete row of discal cilia near caudal margin. Similar row of 10-12 cilia near distal half of cephalic margin.

Trochanters two segmented, femora somewhat swollen. Foretibial spur not forked. Tarsal segments short, basitarsi barely longer than segment 2.

Abdomen ovoid, scarcely longer than wide, sparsely covered with long setae. Ovipositor not projecting beyond apex of abdomen, nor produced anteriorly beneath thorax.

Male. Unknown.

Described from single specimen mounted in gum damar. *Holotype*, female, collected by sweeping native vegetation at OAKVILLE, CALIFORNIA, on May 3, 1948 (R. L. Doutt).

Type deposited in collection of the Division of Biological Control, University of California.

The antennal characters, particularly the expanded scape and the subglobose funicle segments, serve readily to distinguish *conferta* from all other North American species.

Anaphoidea gerrisophaga Doutt, new species

Female. Length 0.50 mm. Head, thorax, abdomen, antennae of brown color. Legs, somewhat lighter. Margin of forewings fumated. Posterior wings fumated. Eyes deep red, nearly black. Ocelli red.

Antennae inserted high on face, general conformation as in Fig. 1. Scape, pedicel of equal width; funicle segment one small, normal for genus; segment 2 smaller than 3; segments 5, 6 somewhat longer and wider than segment 2. Club divided, segments subequal; club wider than scape.

Head about as wide as long; distinctly broader than thorax. Frontoververtex reticulate, bearing 4 distinct, erect setae as viewed frontally; another pair of setae located near upper margin of each eye. Eyes slightly hispid. Ocelli large. Mandibles with 3 large, coarse, equal teeth.

Pronotum with 4 large curved setae. Mesoscutum with 2 prominent setae, each near anterior portion of respective parapsidal suture. Each axilla with single seta.

Forewings very narrow, fig. 2, unusual for genus, nearly parallel sided with no marked expansion distally. Tibial spur of foreleg bifid, basitarsus longer than following segment.

Abdomen long, oval, nearly twice longer than wide. Ovipositor barely projecting beyond apex of abdomen, not produced anteriorly beneath thorax.

Male. Unknown.

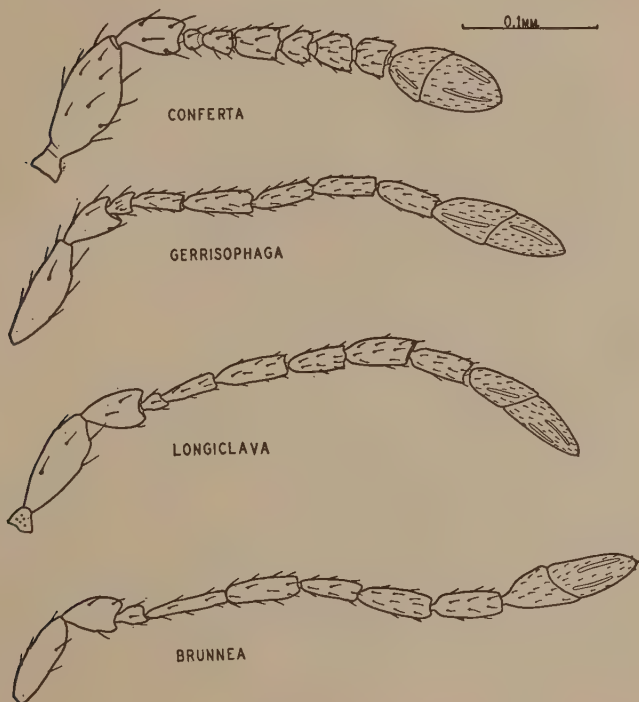


Figure 1. Antennae of new species of *Anaphoidea* from California.

Described from two specimens mounted in gum damar, on individual slides. *Holotype*, female, reared from eggs of *Gerris* sp., LAKE BRITTON, SHASTA COUNTY, CALIFORNIA, on June 29, 1947 (R. L. Usinger). *Paratype*, female, collected on window, El Cerrito, California, on June 11, 1948 (R. L. Doutt).

Holotype and paratype in collection of Division of Biological Control, University of California.

This species is characterized by the very narrow forewings which are nearly parallel sided and lack any marked distal expansion. The prominent setae on thorax and frontovertex together with the large ocelli also serve to separate *gerrisophaga* from other American species. The *Gerris* host record is unique for the genus.

Anaphoidea longiclava Doult, new species

Female. Length 0.45 mm. Color variation in specimens examined ranged from pallid brown to dark brown. Forewings mostly hyaline, slightly fumated in band near apex of venation and around distal wing margin. Eyes black, ocelli red.

Antennae inserted high on face, form as in Fig. 1. Scape convex ventrally, with slight reticulate sculpturing. Scape, pedicel of equal width. Funicle segment 1 small, segments 2, 4 subequal, smaller than segment 3. Segment 5 subequal to 3. Segment 6 of same length as segments 2, 4 but wider. Club elongate, divided, somewhat wider than funicle, distal segment longer than basal segment.

Head about as wide as long. Area posterior to ocelli with reticulate sculpturing, face and frontovertex nearly smooth.

Thorax normal for genus, nearly smooth but scutellum finely striate, scutum with faint reticulations anteriorly. Legs normal, foretibial spur curved, bifid. Basitarsi about equal in length to following segments, not distinctly longer. Forewings of moderate width, fig. 2. Posterior wings with sparse row of discal cilia near cephalic margin and more complete row near caudal margin.

Abdomen ovoid, distinctly shorter than thorax, dorsal surface with transverse rows of long conspicuous setae. Ovipositor slightly produced forward beneath thorax, ovipositor barely projecting from apex of abdomen.

Male. Unknown.

Described from two specimens mounted in gum damar on individual slides. *Holotype*, female, collected by sweeping native vegetation at MORGAN HILL, CALIFORNIA, on July 2, 1947 (R. L. Doult). *Paratype*, female, collected by sweeping *Salix* sp. at Rio Nido, California, on May 28, 1947.

Holotype and paratype deposited in collection of Division of Biological Control, University of California.

The species *longiclava* is easily separated from *conotracheli* by the narrow club, the relatively more elongate funicle segments, and by lacking a marked projection of the ovipositor beneath the thorax.

Anaphoidea brunnea Doult, new species

Female. Length 0.46 mm. Head, thorax, abdomen dark brown. Legs, antennae somewhat lighter. Forewings hyaline except for indistinct fumation near venation and along distal portion of cephalic margin. Posterior wings with slight maculation. Eyes, ocelli black.

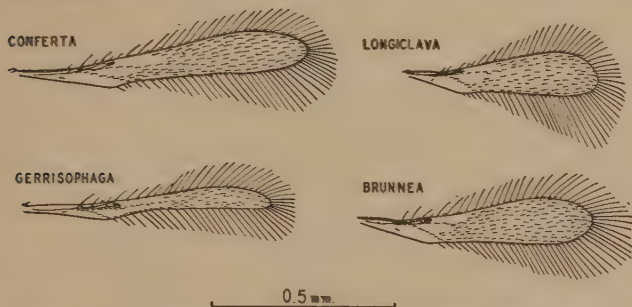


Figure 2. Wing outlines of new species of *Anaphoidea* from Calif.

Antennae inserted high on face. Scape not strongly convex ventrally, fig. 1. Pedicel slightly wider than scape, wider than funicle. Funicle segment 1 small, segment 2 longest, narrowest funicle segment. Funicle segment 4 distinctly smaller than 3 or 5. Segments 3, 5, 6 subequal. Club divided, widest antennal structure equal in length to funicle segments 5, 6, combined.

Head somewhat longer than wide. Thorax mostly smooth with barely perceptible striations. Fore femora more swollen than middle or hind femora. Spur of foretibia curved, bifid at tip. Basitarsus of foreleg distinctly longer than subsequent segment. Basitarsi of middle and posterior legs barely longer than subsequent segments. Forewings of moderate width. Fig. 2. Posterior wings with a row of discal cilia near distal portion of wing blade center; a sparse row of discal cilia near cephalic margin, another complete row on caudal margin.

Abdomen much shorter than thorax, ovoid. Ovipositor distinctly produced forward beneath thorax.

Male. Unknown.

Described from four specimens mounted in gum damar on individual slides. *Holotype*, female, and 2 female paratypes collected by sweeping native vegetation at FORESTVILLE, SONOMA COUNTY, CALIFORNIA, on April 16, 1947 (R. L. Doult). One paratype female collected on window, El Cerrito, California, on March 6, 1948 (R. L. Doult). *Holotype* and 2 paratypes deposited in collection of Division of Biological Control, University of California. One paratype deposited in U. S. National Museum.

In comparison with *calendrae* and *conotracheli*² this species is easily differentiated by the second funicle segment which is distinctly longer than segment 3. The forewings are relatively broader than those of *calendrae*.

KEY TO NORTH AMERICAN ANAPHOIDEA

FEMALES

1. Funicle segments except segment 1 distinctly longer than wide 2
 - Funicle segments subglobular or quadrate, scape strongly convex ventrally*conferta* Doutt
2. Funicle segment 2 distinctly longer than segment 3.....3
 - Funicle segment 2 not distinctly longer than 3, may be equal to 3 4
3. Funicle segment 2 narrowest funicle segment, segment 4 smaller than all segments except 1. Species brown, moderate size*brunnea* Doutt
 - Funicle segment 2 no slenderer than other segments; cephalic tibiae yellow, body black, large species*sordidata* Girault³
4. Forewings quite narrow, more or less parallel sided without marked distal expansion, see fig. 2. Funicle 2 distinctly shorter than 3.....*gerrisophaga* Doutt
 - Forewings of moderate width, normal, if narrow then funicle 2 subequal to 3.....5
5. Basitarsi distinctly longer than following segments. Funicle segment 2 nearly equal to segment 3. Funicle segment 6 shorter than any segment except segment 1.....*calendrae* Gahan
 - Basitarsi not distinctly longer than following segments.....6
6. Ovipositor strongly produced anteriorly beneath thorax.....*conotracheli* (Girault)⁴
 - Ovipositor not strongly produced anteriorly beneath thorax.....*longiclava* Doutt

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²The author wishes to acknowledge the generous loan of specimens for study by C. F. W. Muesebeck and A. B. Gahan of the U. S. National Museum.

³No specimens of *sordidata* examined, data in key taken from literature.

⁴Girault (Private publication) synonymized *pullicrura* Girault and *luna* Girault with *conotracheli* (Girault).

SEPSIDAE FROM THE AUSTRALASIAN REGION (Diptera)

BY GEORGE C. STEYSKAL
Grosse Ile, Michigan

Two small collections of Sepsidae, made respectively by Clifford O. Berg and Jean Laffoon while they were engaged in malaria control work with the armed forces during the recent war, were generously turned over to the writer for determination, and an interesting lot of regional material belonging to the United States National Museum was also made available through the kindness of Curtis W. Sabrosky. Study of the material has brought to light two new species and one new subspecies, some synonymy, and some distributional data from little known areas.

KEY TO THE AUSTRALASIAN GENERA OF THE FAMILY SEPSIDAE

(Mesopleural bristle always present, although small in *Toxopoda* and *Perochaeta*. The Formosan genus *Myrmecosepsis* Kertész [1914, Ann. Mus. Nat. Hung. 12:244], not included below, was placed in the Chloropidae by its describer, but Hennig [1941: 131] has listed it with the Sepsidae; it is an almost wingless fly with long, erect, quill-like bristles on the dorsum).

- 1 (2). First and second basal cells of wing united; orbital bristles lacking; abdomen constricted behind second tergite; abdominal macrochaetae present
.....*Australosepsis* Malloch
- 2 (1). First and second basal cells separated 3
- 3 (4). Thorax and abdomen dull black; abdomen with silvery pruinose bands; abdominal tergites lacking bristles and setae; humeral bristle minute; outer verticals (postoculars) lacking; one pair of DC*; lower margin of face projecting; middle femora of male bent in middle.....
.....*Toxopoda* Macquart
- 4 (3). Body usually shining, at least on parts of pleura; microsetae present, and often macrochaetae on abdomen 5
- 5 (12). A pair of strong orbital bristles present; abdomen lacking macrochaetae except at tip, not or but slightly constricted behind second tergite; always only one DC; wings not spotted 6

*The following abbreviations are used: DC - dorsocentral bristles of mesonotum; PV - postvertical bristles; *tp* - hind crossvein (*transversa posteriore*).

- 6 (7). PV lacking; one or two strong acrostichals behind the suture; humeral bristle present; preapical tibial bristles evident on middle and hind legs; male hind tibiae with dorsal slit or "cicatrix" *Xenosepsis* Malloch
- 7 (6). PV present; no strong acrostichals 8
- 8 (9). Humeral bristle lacking; vibrissae duplicate; male fore tibiae with ventral emargination bearing in its middle a broad, scraper-like tooth *Decachaetophora* Duda
- 9 (8). Humeral present; only one well developed vibrissa 10
- 10 (11). Wings distinctly gray; genal bristle strong; male hypopygium with forked lateral processes; fourth sternite tufted; female fore femora with a small anteroventral bristle at apical third *Parameroplus* Duda
- 11 (10). Wings hyaline or scarcely gray; genal bristle indistinct or lacking; male hypopygial processes simple, cruciate, with dense, long hairs and bristles on convex side; fore femora of female anteroventrally with four bristles (*M. beckeri*) or without bristles (*M. sauteri*) *Meroplus* Rondani
- 12 (5). Orbital bristles lacking or very small; abdomen with or without preterminal macrochaetae, strongly constricted behind second tergite; usually two DC; wing with or without spots 13
- 13 (14). Humerals and postoculars lacking; no wing spots; one DC; abdomen without macrochaetae; male with peculiar lateral processes on fourth sternite *Perochaeta* Duda
- 14 (13). Humerals and postoculars present; wing spot present at tip of second vein or apically or wing unmarked or marked basally only 15
- 15 (16). Front, thorax, and legs with long hair; one DC; no abdominal macrochaetae *Lasionemopoda* Duda
- 16 (15). Front without hair; two DC (except in some species of *Sepsis*); wing spot and abdominal macrochaetae present or not 17
- 17 (18). Abdomen of the male always, and often of the female also, with distinct macrochaetae; wing spot, if present, only in vicinity of vein 2 *Sepsis* Fallén
- 18 (17). Abdomen of both sexes without distinct macrochaetae, although sometimes with somewhat stronger hairing of the tergal margins and with strong anal bristles; wing darkened along costa basally and sometimes with apical spot 19
- 19 (20). Wings blackened only at base; sternopleura shining anteroventrally *Dicranosepsis* Duda
- 20 (19). Wings with spot at or near tip; sternopleura wholly or partly pruinose *Parapalaeosepsis* Duda

The description of *Xenosepsis sydneyensis* Malloch (1925: 315) is insufficient to distinguish it from the generitype of *Pseudomeroplius* Duda (*P. acrostichalis* Duda, 1926a:11), the only point of difference being in the number of strong acrostichals. The latter genus is therefore considered synonymous.

The writer cannot distinguish two categories of generic rank in *Parapalaeosepsis* and *Poecilopterosepsis*: he accordingly considers the latter synonymous on the basis of page priority (Duda 1926a:42 and 43 resp.). The generitype of *Parapalaeosepsis* is *Sepsis plebeia* De Meijere, the sole originally included species. The known species, together with two new species and one new subspecies, may be separated in the male sex as in the following table. The species are characteristically New Guinean. Those examined by the writer (*P. apicalis*, *P. basifera*, *P. laffooni*, and *P. mesopla*) have a single distinct, posteriorly curved bristle at the apex of each hind coxa, weak and short in *P. mesopla*, but strong in the others.

KEY TO MALES OF THE GENUS PARAPALAEOSEPSIS

- 1 (2). Middle basitarsi compressed, much broader than second tarsal joint and furnished with scales; claspers pointed (Amboina; Aru Is.; New Guinea)*P. basifera* Walker
- 2 (1). Middle basitarsi slender, cylindrical, not greater in diameter than second joint 3
- 3 (4). Middle femora armed beneath with strong spinules projecting apicad at an angle of 45° from tuberculiform bases; wings with median cloud (New Guinea)*P. mesopla* Steyskal
- 4 (3). Middle femora not armed as above; wings without median cloud 5
- 5 (6). Middle basitarsi partly black; crossveins as far apart as 1.5 times length of *tp*; a basally directed spinule present between the two longer apically directed ones posteroventer [Curran 1936: 31]; New Guinea; Lesser Sunda Is.; India; Ceylon; Formosa)*P. plebeia* De Meijere
- 6 (5). Middle basitarsi wholly yellowish, at most narrowly blackish at tip; crossveins not farther apart than length of *tp* 7
- 7 (8). Fore tibiae distinctly emarginate medially; wing spot large, extending to or nearly to fourth vein; claspers spatulate at tip (New Guinea; Solomon Is.)*P. apicalis* De Meijere
- 8 (7). Fore tibiae not emarginate; wing spot smaller 9

- 9 (10). Wing spot large, extending from before tip of second vein to or shortly beyond third vein; claspers cultriform *P. laffooni* Steyskal
- a. Wing spot filling out tip of submarginal cell, extending into first posterior cell (New Hebrides) *P. laffooni laffooni*
- b. Wing spot roundish, not filling out tip of submarginal cell, extending only to third vein (New Caledonia) *P. laffooni noumeae* Steyskal
- 10 (9). Wing spot consisting of a band from before middle of second costal section to beyond end of third vein; claspers ? (New Guinea) *P. limbata* De Meijere

In the course of the writer's work on the material listed below he came to certain conclusions regarding synonymy of some of the species. He was pleased to find that Hennig, who admirably figured some of the diagnostic parts, came to similar conclusions in his work on the Lesser Sunda Islands material (1941a). The writer has used the distinctions tabulated below in making his determinations in the genus *Sepsis*.

KEY TO THE AUSTRALASIAN SPECIES OF THE GENUS *SEPSIS**

- 1 (10). Wing entirely without spot at end of second vein; pteropleura sometimes pruinose 2
- 2 (5). Sternopleura anteroventrally strongly shining, not pruinose 3
- 3 (4). Abdomen rugulose, dully shining; middle tibiae with a strong bristle dorsally at the apical sixth; pteropleura partly pruinose; hind femora with a distinct ventral bristle near base; male fore femora with a very strong tooth-like projection slightly apicad of middle bearing a few crowded stubby spinules, closely apicad of which is a secondary tubercle bearing only small and weak bristles; male fore tibiae simple, straight or sinuate, unarmed; male hind femora clavate *S. indica* Wiedemann (*S. spectabilis* De Meijere)
- 4 (3). Abdomen scarcely rugulose transversely and strongly shining; middle tibiae at most with a small subapical bristle; pteropleura wholly shining; male fore femora with stout bristle at middle (mid-spine), immediately apicad of which is a rather broad tubercle bearing several stubby spinules; male fore tibiae sinuate below, armed with a curved row of spinules in basal half; male hind femora not clavate *S. lateralis* Wiedemann
- 5 (2) Sternopleura wholly pruinose 6

*Some species of Walker and Brunetti remain unelucidated.

- | | | | |
|----|-------|---|----|
| 6 | (7). | Pteropleura pruinose; abdomen shining; male fore femora and tibiae of <i>S. indica</i> type..... | |
| | | <i>S. trivittata</i> Bigot; <i>S. decipiens</i> De Meijere | |
| | | Hennig (1941a:146) considered <i>S. trivittata</i> a synonym of <i>S. indica</i> , and the writer suspects likewise of <i>S. decipiens</i> , but he lacks material. | |
| 7 | (6). | Pteropleura shining; male fore femora with a mid-spine, apicad of which is a more or less distinct tubercle; male fore femora armed with a row of spinules basiventrally..... | 8 |
| 8 | (9). | Male fore femora ventrally beyond the mid-spine with a large yellow apically spinulate process; male fore tibiae postero-apicad of the row of spinules with a short, thorn-like process; hypopygial processes slender and short..... | |
| | | <i>S. tuberculata</i> Duda | |
| 9 | (8). | Male femora with a broad low hump furnished with several rather large spinules apicad of mid-spine; male fore tibiae basally with a short row of spinules immediately followed by a bare roundish swelling; hypopygial processes longer and stouter | |
| | | <i>S. coprophila</i> De Meijere | |
| 10 | (1). | Wings with a more or less distinct spot or spots in vicinity of end of second vein or directly over same; pteropleura shining | 11 |
| 11 | (12). | Sternopleura wholly pruinose; only one DC, rarely with weak second one; male fore femora of <i>S. punctum</i> type, with a small apically directed process in the emargination; hypopygial process short and broad | |
| | | <i>S. latiforceps</i> Duda | |
| 12 | (11). | Sternopleura at least anteroventrally shining; two well developed DC | 13 |
| 13 | (14). | Distal section of third and fourth veins distinctly convergent; spot at tip of second vein unusually small and roundish; cheeks approximately as wide as third antennal joint; hind femora without bristles; male fore femora without anterobasal hairy patch, with a few spinules below in apical third; hypopygial processes with a small anterior tubercle, apicad of which they are curved forward C-wise | |
| | | <i>S. thoracica</i> Rob.-Desv. | |
| 14 | (13). | Distal section of third and fourth veins almost parallel; male fore femora with anterobasal patch of hair, without spinules below in apical third | 15 |
| 15 | (16). | Wing tip, except the veins, whitish, the dark spot elongate, diffuse, cheeks half as wide as third antennal joint; male hind femora with anterodorsal preapical bristle | |
| | | <i>S. albopunctata</i> Lamb | |
| 16 | (15). | Wing tip not whitish; cheeks approximately as wide as third antennal joint; male hind femora without bristles..... | |
| | | <i>S. barbata</i> Becker | |

NOTES ON MATERIAL EXAMINED

AUSTRALOSEPSIS NIVEIPENNIS Becker

SOLOMON IS.: New Georgia, September 4 (C. O. Berg).

NEW HEBRIDES: Espiritu Santo, Second Channel, November 4, 1943. (J. Laffoon).

Duda (1926:31) referred this species to his genus *Saltelliseps*. In the previous year Malloch (1925:514) described *Australosepsis fulvescens* and a variety *atrata*, which are apparently the same as Becker's species. Malloch suggested the specific and stated the generic synonymy (1928:307; 1928a:611), and Hennig (1941a:146) has made the combination. The males of our material are nearly all of a yellowish or reddish color, while the females are black. A similar condition is found in *A. tenella* De M. (v.i.). *A. niveipennis* is known from several localities in Africa (Morocco, Egypt, Abyssinia, Togo), Formosa, Lesser Sunda Is., Philippine Is., and Australia.

AUSTRALOSEPSIS TENELLA De Meijere

PHILIPPINE IS.: Los Baños, Luzon (Baker); Puerto Princesa, Palawan, August 12, (R. C. McGregor), both in USNM.*

Hennig (1941a:146) found the proportion of red to black males to be 45:12. Our material is approximately in that proportion also, but intermediates make it difficult to make a numerical statement. The species is known from Ceylon, Singapore, Lesser Sunda Is., Philippine Is., Formosa, and New Caledonia.

DICRANOSEPSIS BICOLOR Wiedemann

SUMATRA: Blang Rakal, NGS SI Exp. 1937 (Mann), in USNM.

PHILIPPINE IS.: Manila, October, 1924 (R. C. McGregor, Robert Brown); Limay, Bataan (R. C. McGregor); Puerto Princesa, Palawan, August 12, 1925 (R. C. McGregor), all in USNM.

RYUKYU IS.: Okinawa Id., June 22 to July 12, 1945 (W. G. Field, F. N. Young), in USNM.

MARIANA IS.: Point Oca, Guam, May, 1945 (G. E. Bohart and J. L. Gressitt); Asan, Guam, Jan. 31, 1948, near carabao dung (K. L. Maehler); Inarajan, Guam, December, 1947, on carabao dung, all in USNM.

*United States National Museum.

NEW GUINEA: Cyclops Mts., 1000 ft. (J. Laffoon); Finschhafen, November 9, 1944 (D. G. Hall), in USNM.

SOLOMON IS.: Guadalcanal, September 10, 16, November, 1944 (C. O. Berg); New Georgia (Berg).

NEW HEBRIDES: Espiritu Santo, Second Channel, August, 1944 (J. Laffoon).

It has not been feasible to distinguish any of the many named "varieties" in the present material. The distinctions cited by Duda (1926:47; 1926a:54) apparently occur within populations; all forms, for example, are cited from Formosa (cf. also Hennig 1941:131). Hennig (1941a:146) considered it advisable to treat them as "Formen einer Art."

The species is known from India to Formosa and southward to New Guinea, but apparently not yet from Australia. Curran (1936:32) recorded it as *Sepsis javanica* De M. from San Cristoval Island in the Solomons and Matema Island in the Santa Cruz group.

LASIONEMOPODA HIRSUTA De Meijere

AUSTRALIA: Botany Bay and Blawarra, New South Wales (H. Peterson), in USNM.

An easily recognized species thus far recorded only from Botany Bay, Sydney, Parramatta, and Como, all in New South Wales.

PARAPALAEOSEPSIS APICALIS De Meijere

(Figure 1a)

NEW GUINEA: Finschhafen, April 9, 1944 (E. S. Ross), in California Acad. Sci.

SOLOMON IS.: Guadalcanal (C. O. Berg); l.c., November, 1944 (J. Laffoon), in USNM.

The reasons for referring this species to *Parapalaeosepsis* have been given above. The species has been previously found only in New Guinea (S. E. Paumotu River and Astrolabe Bay).

PARAPALAEOSEPSIS BASIFERA Walker

NEW GUINEA: Cyclops Mts., 1000 ft., March, 1945 (J. Laffoon), in USNM.

Known from Amboina, Aru Is., and New Guinea (Paumotu River).

Parapalaeosepsis laffooni Steyskal, new species
(Figure 1b, c)

Male and Female—Length 3.4 mm. Very similar to *P. apicalis* De M. and *P. limbata* De M., differing as shown in the foregoing key. Purple-black in color, except parts of the legs as follows: fore legs as far as middle of third tarsal joint; middle and hind legs as far as basal fourth of femora, the transition to black rather gradual; apical fourth of middle tibiae, also with gradual transition; middle tarsi to middle of third joint; these parts yellowish. Middle basitarsi equal in length to remainder of tarsi, slender and cylindrical. Sternopleura strongly pruinose except on the shining lower anterior aspect. Posterior half of pteropleura also pruinose. Wings hyaline except small basal area and large apical brown area, as in figure.



Wing of *Parapalaeosepsis apicalis* DeM., male showing extent of apical spot in A) *P. apicalis* DeM., male; B) *P. laffooni* n. sp., male; C) *P. laffooni* n. sp., female.

Male—Hypopygium with cultriform processes, rather sharply pointed at tip. Fore femora and tibiae in posterior view very similar to those of *P. basifera* Wlk., as figured by Duda (1926a:105, pl. VIII, fig. 68a), the anterior face with two small, more distinct setulae near base, slightly basad of middle with one large and two moderate posteroventral spines (the latter of which are half as long as the former) and one anteroventral spine nearly as long as the large posteroventral. Fore tibiae not emarginate medially.

Holotype, male, NEW HEBRIDES, ESPIRITU SANTO ISLAND, Second Channel, July, 1944, no. 143 (Jean Laffoon), and *Allotype*, female, same data, no. 138, in USNM, type no. 58802; *Paratypes*, same data, nos. 135, 138, 139, one pair in the author's collection, the remainder in the collection of Jean Laffoon.

Parapalaeosepsis laffooni noumeae Steyskal, new subspecies

Male and Female—Similar to the typical form, but with a reduced wing spot. In the male the spot barely attains the third vein posteriorly and toward the wing tip only shortly beyond the tip of vein 2, leaving an appreciable area in the tip of the sub-

marginal cell hyaline. The wing spot of the female is but very slightly smaller than in the typical subspecies.

Holotype, *Allotype*, and four female *Paratypes*, NEW CALEDONIA, NOUMEA, July 24, 1944 (Wilfred Crabb), no. 58803 in USNM.

Parapalaeseopsis mesopla Steyskal. new species

Male—Length 5.1 mm. An aberrant species, distinguished as in the foregoing key.

General color black. Fore legs yellow, except for rather brownish femora and two black ultimate tarsal joints. Hind femur gradually becoming yellowish in the basal fifth and middle tibiae also a little brownish toward tip. Only a basal part of one middle basitarsus is preserved; this and the basal two joints of the hind tarsi are yellowish. Face also rather yellowish. Antennae beyond the first join missing.

Mesonotal disc brownish pruinose, humeri, propleura, stripe above the fore coxae, lateral aspect of sternopleura, and the entire pteropleura, bluish white pruinose. Hypopygium (well turned in) yellowish.

Wings hyaline, costal cell and root area blackish, a diffuse light brown cloud over *tp* and extending into submarginal cell, wing tip from before second vein to beyond fourth vein broadly dark brown, membrane between the median cloud and the brown tip whitish.

Fore femora straight above, below sloping in a straight line to each end from a neatly median group of four rather small spines on a tiny tubercle. Fore tibiae straight, somewhat tumid in apical two-fifths, where they are furnished with many fine erect hairs, some of which are also present on all joints of fore tarsus. Middle femora equal in length to hind, but a little heavier and furnished below with a double row of short but stout spinules placed on tuberculiform bases and directed approximately 45° apicad. Apical two-fifths of middle tibiae bearing on ventral and posterior surfaces a group of about 16 macrochaetae, each about as long as diameter of tibia.

Apparent first abdominal segment with a pair of strong lateral bristles and a group of ten rather long dorsal ones. Abdomen somewhat collapsed apically, but shining and furnished with coarse hairs and at least a pair of strong macrochaetae on the dorsum of hypopygium.

Holotype, male, CYCLOPS Mts., NEW GUINEA, 1000 ft., March, 1945 (Jean Laffoon), in USNM, type no. 58804.

SEPSIS ALBOPUNCTATA Lamb

NEW HEBRIDES: Espiritu Santo, Second Channel, January 2, July August, 1944 (J. Laffoon); l.c., September, 1944 (K. L. Knight), in USNM.

Sepsis hirtifemur Malloch (1925:312) is apparently synonymous. The species is known from Eastern Africa, Madagascar, Seychelles Is., Australia (New South Wales), and Lesser Sunda Is.

SEPSIS INDICA Wiedemann

PHILIPPINE IS.: Los Baños (Baker); Manila; Limay, Bataan; Silang, Cavite (all R. C. McGregor), all in USNM; Puerto Princesa, Palawan, August 12, 1925 (R. C. McGregor), in USNM.

The writer agrees with Hennig (1941:146) that *S. spectabilis* De Meijere is synonymous and believes it likely that *S. trivittata* Bigot and *S. decipiens* De Meijere may be also. Curran (1936:31) recorded a single female of *S. spectabilis* from Bellona Id. in the Solomons. Other records place it as widespread in the Australasian region east to New Guinea and the Philippine Is.

SEPSIS LATERALIS Wiedemann

RYUKYU IS.:Okinawa Id., 1945 (W. D. Field), in USNM.

PHILIPPINE IS.: Manila (Robert Brown), in USNM.

The species is a widespread one in the Mediterranean region and the Near East, Africa, Madagascar, India, China, Formosa, and New Guinea.

SEPSIS TUBERCULATA De Meijere

PHILIPPINE IS.: Victorias, Occ. Negros, September 19, 1927 (W. D. Pierce); Puerto Princesa, Palawan (R. C. McGregor), both in USNM.

Known from Ceylon, Java, Formosa, Australia (North Queensland), and Lesser Sunda Is.

TOXOPODA NITIDA Macquart

SUMATRA: Brastagi, May (F. J. Meggitt), in USNM.

NEW GUINEA: Finschhafen, September 9, 1944 (D. G. Hall), in USNM.

SOLOMON IS.: New Georgia; Guadalcanal (C. O. Berg).

The writer believes that this is the only known species of *Toxopoda* and that *T. atrata* Malloch (1928:308; 1928a:611) is a synonym. It is known from North and Central Africa, India, China, Formosa, Philippine Is., Lesser Sunda Is., and Australia (Queensland).

It seems pertinent to mention that no Sepsidae have been

recorded in the British Museum's monumental work on the insects of Samoa and that Bezzi (1928) recorded none from Fiji.

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ANOTHER RECORD OF FLEBOTOMUS IN CALIFORNIA

(Diptera: Psychodidae)

In September of 1947 two specimens of the genus *Flebotomus* were taken within my residence at 960 Vermont Street, San Jose, Santa Clara County, California. Both specimens were given to Dr. M. A. Stewart of the University of California. On May 24, 1948, another specimen was caught flying to a lamp in my apartment. Using the descriptions given by Mangabeira, O. F. and P. Galindo (The Genus *Flebotomus* in California, American Journal of Hygiene 40(2): 182-195, 3 pl. 1944) this specimen, a male, was determined to be *Flebotomus vexator* Coq., previously recorded from creek beds and ground squirrel holes in Alameda and Contra Costa Counties.—CHARLES P. HOYT, *Stanford University, California.*

THE ANTS OF BIKINI ATOLL, MARSHALL ISLANDS¹

(Hymenoptera)

BY A. C. COLE

*Department of Zoology and Entomology,
University of Tennessee, Knoxville*

During July and August, 1947, the writer was a member of the Bikini Scientific Resurvey Staff which made extensive studies of Bikini Atoll. In addition to collecting insects in general, the writer made a special effort to obtain and study representatives of all of the kinds of ants nesting on the islets.

Physical environmental conditions on Bikini Atoll are not particularly inducive to the maintenance and dissemination of ant colonies. The small size of the islets, together with the broad expanses of coral sand, the poor soil of the vegetated areas, and the inundation of many parts during severe storms are not favorable for extensive colonization by ants.

No species was present in any great abundance, either in colonies or in individuals, and ants were not a conspicuous element of the insect population. The ants nested in the soil, in or beneath detritus, in decayed and dry coconuts, and beneath the loose bark of dead trees. Few arboreal nests were found although many of the ants foraged on trees and shrubs. The most abundant and conspicuous component of the ant fauna was *Iridomyrmex anceps* (Roger). This species was taken on all of the well vegetated islets and even on Rokar Island with its scanty vegetation. In general the species of ants found on any one of the vegetated islets were those which also inhabited the other vegetated islets, although the proportions of nests of the different species varied somewhat. Most of the ants of Bikini Atoll are tramp species which have a wide distribution in Micronesia.

The various species and subspecies collected are the following ones the determinations of which have kindly been made by Dr. M. R. Smith:

¹Contribution no. 26, Dept. of Zoology and Entomology, Univ. of Tenn.

1. *ODONTOMACHUS HAEMATODA* (L.)

Rather numerous colonies were found nesting in soil in shaded areas beneath fallen coconut trees and loose stumps on Bikini, Namu, Enyu, and Prayer Islands. Males and females were in some of the nests from mid-July until mid-August. During this period some nests contained only workers and males whereas other nests contained only workers and females. The males took to the air almost immediately after having been exposed and flew away. The females scurried to cover but did not fly. No colony was large; the most populous ones contained only about 50 workers. The workers foraged slowly on the open soil during overcast days and early morning and late evening hours. When disturbed they moved rapidly.

2. *MONOMORIUM DESTRUCTOR* (Jerdon)

Several colonies of these tiny ants were collected from within fallen coconuts on Bikini, Namu, and Enyu islands. Workers and multiple queens were in the nests.

3. *MONOMORIUM FLORICOLA* (Jerdon)

This species was rather well represented on Bikini Island where it nested within the shells of fallen coconuts. It was less common but occupied the same habitat on Enyu, Namu, and Prayer islands.

4. *MONOMORIUM PHARAONIS* (L.)

Only two nests were found and these were in the soil beneath fallen pandanus fruit on Bikini Island.

5. *PHEIDOLE* sp.

Numerous workers of an unidentified species were taken as they were running on shaded soil of Namu Island. Soldiers were not collected and the nest was not found.

6. *TETRAMORIUM SIMILLIMUM* (F. Smith)

Isolated workers were taken on Bikini, Enyu, and Prayer islands but nests were not found.

7. *TAPINOMA MELANOCEPHALUM* (Fabricius)

Numerous workers were collected from trunks of trees on Bikini, Enyu, and Prayer islands.

8. *TAPINOMA* sp.

A single nest of what might possibly be *T. indicum* Forel was found beneath loose bark of a tree on scantily vegetated Rokar Island.

9. *IRIDOMYRMEX ANCEPS* (Roger)

This proved to be the most common ant on the islets. The workers construct in the sandy soil of open areas crater nests with usually a single, large, irregular, basal opening. A few nests with two or three openings were observed. The craters averaged approximately 6 inches in diameter. Colonies were populous and the workers very active. Brood was located in chambers about 7 inches below the nest entrance. Males were in the nests in mid-July. Workers were found running on the soil and up and down tree trunks. Nests were taken on Bikini, Enyu, Namu, Prayer, and Rokar islands.

10. *PARATRECHINA (NYLANDERIA) BOURBONICA* Forel

Isolated workers were taken on Bikini and Enyu islands. They were running on the ground.

11. *PARATRECHINA LONGICORNIS* (Latr.)

Workers were collected from foliage on Bikini, Enyu, Namu, and Prayer islands.

12. *CAMPONOTUS RETICULATUS BEDOTI* Emery

Workers were found running rapidly on tree trunks and limbs on Enyu and Namu islands.

13. *CAMPONOTUS IRRITANS CHLOROTICUS* Emery

Numerous large colonies were observed on Bikini, Enyu, Namu, and Prayer islands. Most of the nests were beneath fallen coconut palms and under rotting stumps in rather open areas with moderate sunshine. Those ants which nested beneath stumps burrowed into the stumps and placed their brood in the burrows. Brood was often found in abundance between the dry fronds of fallen coconut trees. The workers are very aggressive. Males and females were in the nests during July.

NOTES ON CERAMBYCIDAE FROM THE LOWER
RIO GRANDE VALLEY, TEXAS

(Coleoptera)

BY GEORGE B. VOGT

University of Maryland, College Park

(Continued from page 144)

42. RHOPALOPHORA ANGUSTATA Schffr.

Two specimens from flowers of *Monarda* sp. at "3" on April 13, 1946. Another specimen at flowers of *Baccharis neglecta* Nutt. at "2" on September 30, 1946.

43. ORNITHEA MEXICANA Sturm

A single specimen under loose bark of a dead standing hackberry at "10" on April 28, 1947. Determined by Linsley.

44. STENOSPHEMUS LUGENS Lec.

Frequent on flowers of goldenrod and *Baccharis neglecta* Nutt. at "2" during late September, 1946. Also two on flowers of yellow top at "8" on November 10, 1946. Three emerged on August 28, 1946, from the same *Oncideres* pruned tepehuaje branch described under 76.

45. STENOSPHEMUS DOLOSUS Horn

Not uncommon during September on flowers of goldenrod, sunflower, and yellow top at "2," "8" and three and one-half miles west of Santa Rosa. Three specimens were also taken on March 31, 1946, from a huisache fence post at "10."

46. ANCYLOCERA BICOLOR Oliv.

Five specimens during April, July and September from "2," Pharr, and six miles southwest of Pharr. Three were on huisache, one on *Baccharis neglecta* Nutt. and one on fresh cut tepehuaje.

47. ELYTROLEPTUS DIVISUS Lec.

Frequent on flowers of coyotillo and to a lesser extent on flowers of lote at "6," "9," "22," and "23" during April and May. A single record from coyotillo at "9" on July 4, 1946.

48. CRIOPROSOPIS RIMOSUS Buq.

The larval work of this large colorful species is rather easily detected and is widespread in mesquite trees over the area. The adult beetles, however, are seldom seen unless they be chopped

out of their galleries before emergence. The following observations were made on the habits of the advanced developmental stages of this beetle.

The maturing larva lives in a spacious gallery in the sapwood, mostly less than one inch beneath the bark. The galleries vary in form but are usually straight, about twelve inches in length, and in places their width is about twice that, or more, of the inhabiting larva. Frass, fecula, and sap are cleaned from the walls of the gallery and voided through a small opening to the outside which is always kept plugged against the ubiquitous ants. It is these tailings which the collector should look for. During July, August, and September they are passed in conspicuous quantities. Openings to most galleries were observed near the bases of small to medium-sized mesquite (one and one-half to eight inches in diameter), the galleries often extending underground in roots in the case of smaller trees. But some characteristic work was noted in branches of large trees.

During October the larva enlarges the disposal opening to form an emergence hole which is then plugged tightly with the same type of wood shavings which are used within the gallery to form a pupation chamber. Observations in mid-January showed the larvae still to be in a prepupal stage. No further check was made until late March and April when pupae and teneral beetles were found in the galleries.

The following material is in the writer's collection. Fifteen specimens cut from second growth mesquite on April 27, 1947, and held individually for three weeks to harden. During this hold-over time some of the females oviposited. One specimen emerged from a caged tree on May 15. Nine other caged trees were unproductive due to marauding animals which ripped open the plastic screen, presumably in seeking the emerged beetles for food. One specimen also cut from huisache on April 22. A number of other infested huisache were noted at this locality. All of the above material was taken at locality "7" which was the most heavily infested area observed, with about ten per cent of the trees bearing 1-3 larvae. Infested trees were also observed at "5," "16" and "17" as well as in the towns of Pharr, San Juan, Donna and Weslaco.

The large exit holes left behind the emerging beetles are soon obliterated by wound growth of the tree which undergoes most of its trunk growth during May and June. The vigor of the tree seems unaffected by these borers.

49. STENASPIS SOLITARIA Say

Common on live mesquite at "19," "20," "21" and "22" during May and June, 1947. Larvae which are believed by the writer to be of this species were found in small living branches of mesquite and guajillo at "20" and one mile south of "18" respectively. These larvae live in long, straight, clean galleries which have openings at regular intervals. These openings serve for waste disposal and possibly for ventilation since they are unplugged. In this connection it is interesting to note that the slender cylindrical larva has its terminal segment strongly sclerotized and roughened, obviously as a protection against ants which have free access to the gallery. In the case of the co-tribal larva, *Crioprosopis rimosus*, which consistently plugs its gallery opening, the terminal segment is unmodified.

Unfortunately rearing of the larvae in branches cut in November failed, apparently due to the death of the wood. However, Dr. Anderson considers the larva to be probably a *Stenaspis* though it is unlike any in the U. S. National Collection.

50. STENASPIS INSIGNIS Csy.

Twelve male and one female specimens of this little known species were collected at flowers of coma at "9," October 20 through November 23, 1946.

51. TYLOSIS OCULATUS Lec.

Three specimens on September 29, 1946, from *Abutilon* sp. (probably *A. indicum* L.) growing along the roadside three and one-half miles west of Santa Rosa. Four specimens on November 10, 1946, from *Abutilon* sp. (probably *A. incanum* (Lind.) growing along a canal bank at "8."

52. PLIONOMA SUTURALIS Lec.

Frequent at flowers of coma and at fresh cut mesquite in a clearing at "9" during October and November, 1946. An aberrant record was made at "4" on May 26, 1946, when a specimen was taken on fresh cut brush.

53. TARANOMIS BIVITTATA Dup.

Common on flowers of coma at "9" during October and November, and on flowers of mesquite and *Acacia rigidula* Benth. at "5," "6," "7" and "9" February 16 through April 24, 1946. Also on goldenrod at "2" on September 28 and one specimen on flowering brasil at "9."

54. *MANNOPHORUS LAETUS* Lec.

Common on sunflower and yellow top growing on the roadside at "14" and three and one-half miles west of Santa Rosa during late September and October, 1946. Also two specimens from flowers of guajillo and lote at "22" during May, 1946.

55. *DENDROBIAS MANDIBULARIS* Serv.

Eight specimens on goldenrod at "2" on September 28, 1946. Six on *Croton punctatus* Jacq. and *Amaranthus* sp. in a weedy tomato field at "2" on June 15 and 22, 1946. One on willow post and one on ceniza (*Leucophyllum texanum* Benth.) in Pharr on April 29 and May 3, 1946. One in flight in clearing at "4" on July 27, 1946. Two in copula on fresh cut ebony in clearing three and one-half miles west of Santa Rosa on September 22, 1946. One on *Baccharis neglecta* Nutt. 14 miles east of Raymondsville on November 30, 1946.

56. *LISSONOTUS FLAVOCINCTUS PUNCTICOLLIS* Bates

Numerous records on decadent and fresh cut huisache at "6" and "7" May 19 - June 9, and November 10-17, 1946. One emerged on August 28, 1946, from a huisache branch from "6" which had been pruned by *Oncideres pustulatus*. Also five specimens, in company with numbers of 55, on goldenrod at "2" on September 28, 1946.

57. *PARMENOSOMA GRISEUM* Schffr.

Frequent beating *Yucca* cut during winter of 1946 in a clearing at "22," April 12 through September 20, 1947. Two under dead giant *Opuntia* branches at "22" on September 20, 1946. Five beaten from bases of *Agave heterocantha* Zucc., which had flowered the previous spring, at "17," November 23, 1946 and March 16, 1947.

58. *MONEILEMA ARMATUM* Lec.

This species was found exclusively in the dry uplands ("14," "16," "17," "18," "21," "22" and "23") where it occurred in fair abundance the year round on living as well as diseased and dead giant *Opuntia*. During the warmer seasons, these beetles were found mostly on the upper branches of living cacti where they often were seen feeding on the joints. They were found frequently also on tasajillo (*Opuntia leptocaulis* D. C.), and on one occasion early in March a teneral specimen was chopped from

its pupal cell in viznaga (*Echinocactus texensis* Hopffer).

Moneilema larvae, apparently of this species, on several occasions have been chopped from the trunks of giant *Opuntia* in the uplands. In late October, 1946, the writer had his first experience with larval Moneilema while overturning felled cactus at "14." Larvae were found under the joints and seemed to be associated as much with the coarse soil beneath as with the joints themselves leading to the writer's first impression that these Cerambycid larvae were subterranean in habit. This initial idea, while offset by subsequent observations, may be true to some extent and possibly explain the peculiar papillate ampulae possessed by these larvae.

59. MONEILEMA ULKEI Lec.

This species was found the year round being not uncommon in the Lower Valley at "4" and "5" but rather scarce in the dry uplands at "12," "16," "17" and "18." This beetle was always found associated with giant *Opuntia*, being taken under dead and fresh-cut cactus lying on the ground and on the upper joints of living cactus, sometimes feeding. On numerous occasions this species was found to feign death with the appendages rigidly arranged in a curious and characteristic manner as follows. Antennae extended forward, hind legs outstretched and directed partially backwards, middle legs directed straight backward between the hind legs, and the front legs outstretched anteriorly. *M. armatum* and *Parmenosoma griseum* were observed never to latisimulate in such a characteristic manner.

60. CYRTINUS PYGMAEUS (Hald.)

Two specimens, one swept from succulent vegetation at "10" on March 9, 1946; another on dead soapberry branch at "8" on April 5, 1947.

61. THRYALLIS UNDATUS Chev.

Frequent on fresh dead tepehuaje at "2." Also several emerged on April 1 and May 8, 1946, from the same *Oncideres* pruned tepehuaje branch described under 76. A single specimen was taken at "10" on July 6, 1946, from fresh felled hackberry remote from any tepehuaje.

62. LAGOCHIRUS PROCERUS Casey

On July 5, 1947, two males beaten from a yucca cut during

winter of 1946 in a clearing at "22." Both these specimens are small, measuring only 14.5 and 17.0 mm. in length.

63. LEPTOSTYLUS GIBBULOSUS Bates

Dr. J. N. Knull has examined some of the writer's specimens and considers them co-specific with his *L. monki* described from Donna, Texas. However, *gibbulosus* is used here since, as Mr. Fisher has pointed out to the writer, the material agrees well with Bates' description. This identification seems plausible in view of three similar specimens in the U. S. National Collection from Tampico and Chiapas, Mexico, which serve to bridge the gap between the Texas records and similar material from Central and South America which Bates describes as the habitat of his *gibbulosus*. The specimens in the U. S. National Collection and the material listed below show this species to be rather constant in form and markings.

The writer found this species in nature only as larvae developing in the fruit of soapberry. A study of several dozen infested fruit led to the following observations. The larva develops for the most part in the course of entirely consuming the oily contents of the seed (similar in properties to Brazilnut) which the young larva enters by way of the placenta. For the purpose of disposing of its fecula produced while developing in the seed, the larva probably maintains an opening through the hard endocarp at or near the site of attachment to the placenta. At least, before pupating the larva has eaten through the very hard endocarp and severed the placenta. Possibly by the activity of the larva, the freed stone is rotated somewhat and the larva cuts almost through the exocarp before retreating into the hollow stone to pupate. The stone seems to be fixed into place by the large amount of fecula and frass which has been removed from the interior.

From 1,161 fruit collected at "8" and "10" the writer reared 288 beetles and found 57 of the fruit to have been infested by unsuccessful larvae. All fruit was gathered from the ground on the following dates: December 1, 1946, January 16, February 23, and March 30, 1947. Emergence took place during December, 1946, and between March 11 and May 15, 1947. The fruit was held in Mason jars indoors. It is not felt that this method materially affected the time of emergence of the beetles since indoor temperatures in this case did not seem significantly different from

outdoor temperatures. This belief is supported by the fact that five beetles emerged from fruit within two weeks after being gathered on March 30. Also on December 1, 1946, numerous windfallen fruit were observed to bear fresh emergence holes.

The above stated emergence dates are out of phase with the seasonal development of the soapberries. Since the flowers do not open until late May at this locality, it would seem that beetles emerging early in the spring oviposit on developing flower buds or would have to live at least a month before being able to oviposit on developing fruit. It was believed that oviposition might take place on last year's fruit much of which still hangs in some of the trees during April and May; but on August 25, 400 such fruit were collected and examined with nothing but the previous year's damage being found.

Although the writer was unable to determine the natural whereabouts of the parent beetles, small larvae were found infesting fallen, mostly premature fruit on August 25.

In the course of studying the *Leptostylus* three species of parasites were reared which seemed to be primary in nature. One of these, a Chalcidoid, represented by a single specimen has been lost, but the other two have been determined, one by Mr. C. F. W. Muesebeck as *Heterospilus* n. sp. (Braconidae) and the second Mr. A. B. Gahan has indentified as *Eurytoma* sp. (Chalcidae). The five specimens of the former species emerged from a single mature *Leptostylus* larva. The four specimens of *Eurytoma* emerged singly from mature larvae and in one case from a teneral beetle which had not yet emerged. Also reared from the soapberry fruit are a number of moths which Mr. Carl Heinrich has determined as *Myelois venipars* Dyar (Phycitidae). Their larvae mine the fleshy exocarp of the soapberries. A series of Encyrtid parasites reared from one of these larvae are considered as being of a new genus and new species by Mr. Gahan.

64. *ASTYLIDIUS LEIOPINUS* Csy.

Three specimens comparing well with the type of this species were taken at the lights in Pharr May 4, June 13 and August 4-15, 1947.

65. *LEIOPUS WILTI* Horn

Two specimens from mesquite branches at "20," May 3 and May 24, 1947. Another on dead mesquite at "4" on June 15, 1947.

66. *LEIOPUS TEXANUS* Csy.

Three on dead tepehuaje branch at "5" on April 21, 1946. One beaten from mesquite at "9" on April 14, 1947. Two on huisache branch, pruned by *Oncideres pustulatus*, at "3" on April 13, 1946. One on foliage of *Mimosa Lindheimeri* Gray at "2" on July 3, 1946. And one at light in Pharr September 6-18, 1947.

67. *LEIOPUS HOUSTONI* Csy.

Six specimens at light in Pharr, April, August, and September. Three on branches of decadent or dead huisache at "3," "6," and "13" during April and May. Two beaten from brasil at "4" on June 8, 1947. One on fresh cut hackberry at "10" on June 30, 1946. One on fresh cut granjeno (*Celtis pallida* Torr.) six miles southwest of Pharr on July 12, 1946.

68. *LEPTURGES* sp. probably *confluens* Hald.

Seven from on or under bark of dead hackberry at "10" on May 5 and July 6 and 14, 1946. One beaten from huisache and one on tepehuaje at "2" on June 29 and May 4, 1946. Nine at light in Pharr, May 1 through June 15 and September 1-25, 1947.

69. *LEPTURGES* sp. near *confluens* Hald.

Pupae and teneral adults beaten from fallen dead yucca at "22" on August 10, 1947; and adults beaten from yucca at "12" on September 27, 1947. One at light in Pharr on August 25, 1947, and another on September 6-18, 1947.

70. *DECTES LATITARSUS* Csy.

One on sunflower at "6" on April 21, 1946, and one on goldenrod at "2" on August 31, 1946.

71. *ECYRUS DASYCERUS TEXANUS* Schffr.

Eight specimens; four from dead and dying mesquite at "7," "8," and "9," one from decadent huisache at "7" and three from lights at Pharr; March and June through August.

72. *PYGMAEOPSIS VITICOLA* Schffr.

One swept from weeds along canal bank at Pharr by Mr. J. U. McGuire on September 1, 1947. Another at light in Pharr on July 17, 1946.

73. *CALLIPOGONUS CORNUTUS* (Linsley)

A single specimen taken in flight near decadent willow branches, April 15, 1947.

74. *DESMIPHORA HIRTICOLLIS* (Oliv.)

Ten specimens of this beautiful species were found feeding on terminal shoots of Mexican olive (*Cordia boissieri* D. C.) at "4" on June 15 and again on September 6 and 13, 1947. A single specimen at light in Pharr on October 24, 1946.

75. *LOCHMAEOCLES CORNUTICEPS CORNUTICEPS* (Schffr.)

A single deformed female emerged during late August, 1946, from the same onciderine pruned branch of tepehuaje as described below under 76. Also, four specimens from the lights at Pharr, one on May 1, 1947, two on September 16, 1946, and one on August 15, 1947.

76. *ONCIDERES PUSTULATUS* Lec.

This is the saw beetle, familiar to all people of South Texas. This insect or its work was found at all localities in Hidalgo and Cameron Counties, being always associated with huisache, tepehuaje, and *Mimosa Lindheimeri* Gray. The adult beetles begin to appear in mid-August and remain through November. For oviposition they girdle branches ranging in size from one to two and one-half inches in diameter with the larger branches being confined apparently to tepehuaje which is composed of softer wood. In this area the beetle undergoes a two year life cycle. Rearings have been made from a tepehuaje branch collected at "2" which measured 2½ inches in diameter, representing a remarkable feat of girdling. Also rearings were made from huisache branches collected at "6" and from branches of *Mimosa Lindheimeri* Gray measuring only ½ to ⅝ inches in diameter and collected in a floodway near "4." This *Mimosa*, which is a small bushy shrub, was also observed to be infested by these beetles at "2." In all cases of the rearings, the branches had been girdled about 16 months before they were collected or spotted early in April, 1946. It is interesting to note that the beetles which emerged from the small *Mimosa* branches are fully as large as those which developed from the large tepehuaje branch.

77. *ONCIDERES CINGULATUS* (Say)

Frequently found pruning small branches of huisache and mesquite at "1," "4," "6," "13," "18" and "20" during September and October. Occasionally collected during May, June and July. Also, pruned branches, apparently the work of this species, found on ebony and guajillo.

78. *ATAXIA HUBBARDI* Fisher

Rather common at the lights in Pharr. May through June and again August through October. A single specimen at light at "11" on September 20, 1947.

79. *ATAXIA CRYPTA* Say

Three specimens at light in Pharr, one on May 4, 1946, and two on August 23-31, 1946. Another on coyotillo at "22" on June 24, 1947.

80. *HIPPOPSIS LEMNISCATA* (Fab.)

Two at light in Pharr, May 2 and September 6, 1947.

81. *DORCASTA CINEREA* (Horn)

One specimen on dead yellow top at "9" on October 20, 1946. Also at light in Pharr during September and October.

82. *MECAS CINERACEA* Csy.

On March 23, 1946, five specimens were swept from a pure stand of *Helenium microcephalum* D. C. growing in a dry resaca at "10."

83. *TETRAOPES FEMORATUS* Lec.

Five specimens taken in Pharr on a small species of milkweed which was widespread in alleys and vacant lots of the town, October 8, 1946.

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STUDIES IN THE CANTHARIDAE IV

(Coleoptera)

BY KENNETH M. FENDER
McMinnville, Oregon

PODABRUS COMES Lec. versus PODABRUS PRUINOSUS Lec.

The validity of *Podabrus pruinosus* Lec. and its variety *diversipes* Fall is questionable. The only characters that differentiate this from *Podabrus comes* Lec. are the color of the legs and of the head behind the eyes. The male genitalia would indicate that these are the same species. A long series from diverse areas shows all of the intermediate stages between the two. The difficulty, at least in the Willamette Valley of Oregon, lies in diverse emergence of the species. *Podabrus comes* is the first to emerge in this region. *P. pruinosus* and the variety *diversipes* commence to emerge soon after *P. comes* has started to wane. This condition is not infallable but occurs more frequently than not. Upon several occasions the author has run into pure colonies of each species. For these latter two rather weak reasons, it is considered inadvisable at this time to change the present accepted status of these two species.

PODABRUS BRUNNEUS Fender

This species was described from the Huachuca Mountains of Arizona and was known only by the holotype and allotype. Dr. H. A. Scullen of Oregon State College collected a female of this species in the Santa Catalina Mountains of Arizona on July 22, 1942, extending the known range to those mountains.

Podabrus vandykei Fender, new species

Head yellow in front of eyes, piceous behind; antennae piceous, the first two and the basal half of the third segments pale; palpi flavous, the apices of the last segment piceous. Pronotum flavous. Scutellum and elytra piceous to pale yellowish. Body beneath piceous, the mouth parts, head medially and thorax pale, sides and apices of ventral abdominal segments narrowly pale. Pubescence cinerous. Length 8.5 to 10 mm.

Male. Head wider than pronotum, finely sparsely punctate in front of eyes save for an occasional coarse puncture near the apex of the clypeus; coarsely punctured behind, these punctures sparse near the eyes, becoming quite closely punctate at the constriction of the neck. Antennae rather stout, extending only to the middle of the elytra, second and third segments equal, these slightly shorter than the other segments. Pronotum shining, subquadrate, the anterior angles oblique, the sides parallel from the anterior angles to about the basal half then converging slightly to the hind angles which are prominent; the pronotal base concave; surface finely sparsely punctate, becoming more coarsely closely so anterior to the elevations; median excavation rather deep, the elevations evenly rounded; there is no median impressed line. Elytra sparsely punctured basally, becoming finely rugose apically. Pubescence sub-erect and thick. Body beneath finely closely punctate; seventh ventral with a median impressed line. Claws of the front and middle legs finely cleft, of the hind legs toothed.

Female. Similar to the male. Antennae shorter, reaching to about the basal third of the elytra. Pronotum slightly transverse. All claws toothed.

Holotype: male, FOREST HOME, SAN BERNARDINO CO., CALIF., VI-14-28 collected by E. C. VanDyke; placed in the California Academy of Sciences. *Allotype:* female, Lytle Creek, San Bernardino Co., Calif., VI-8-28, collected by E. C. VanDyke, in the California Academy of Sciences. *Paratypes:* (2) same data as holotype but one collected VI-13-28: (1) Bull Frog Lake, Fresno Co., Calif., 10600 feet, VII-10-10, collected by E. C. VanDyke; (3) Bubbs Creek Canyon, Kings River, Fresno Co., Calif., VII-8-10, collected by E. C. VanDyke; (2) Shaver Lake, Calif., III-21-37.

The San Bernardino County specimens have the elytra piceous while those from Shaver Lake and Fresno County are yellow. There seems to be no character other than the elytral coloration for separating these. The genitalia are similar. *Podabrus vandykei* and *P. simplex* Lec. are the only members of group IV¹ that have the pronotum entirely pale. *P. simplex* is an eastern species known from Pennsylvania to Massachusetts and Canada. It is slightly over one half the size of *P. vandykei* or 5 to 5.5 mm. and the pronotum is dull and much more closely coarsely punctured; shining and finely sparsely punctate in *P. vandykei*.

¹Pan-Pac. Ent., 25:29-32. 1949.

DISCODON NIGRIPES Gorham

A male of this species was collected in the Santa Rita Mountains of Arizona, VI-14-42, by Dr. H. A. Scullen and is a new record for America north of Mexico. Described by Gorham², Champion³ records this species from "Mexico, Tepetlapa and Chilpancingo in Guerrero, Cuernavaca in Morelos, Capulalpam and Panistlahuaca in Oaxaca; Guatemala, Las Mercedes, Volcan de Atitlan."

Discodon abdominale Schaeffer, described from Arizona is the only other North American species that might be confused with *D. nigripes*. They are both flavous above, *D. nigripes* having a broad median black stripe on the pronotum. *D. abdominale* has only the antennae, palpi, apices of femora, tibiae, tarsi and last two ventral abdominal segments black, whereas *D. nigripes* has the antennae and the entire underside including the legs black. The outer claws of all tarsi are cleft, all inner claws simple in *D. abdominale*. The outer claws of the front feet are broadly lobed at base, the outer claws of middle and hind feet cleft and all inner claws simple in *D. nigripes*.

Malthodes greeni Fender, new species

Head dark brown, clypeus and mandibles yellow, antennae piceous with the basal two segments pale. Pronotum dark reddish brown, obscurely paler towards the angles. Scutellum and elytra piceous. Thorax beneath yellow. Body beneath testaceous, coxae, trochanters, apices and bases of femora and tibiae and bases of first tarsal segments pale. Sides of basal five abdominal segments widely pale, the apex of the seventh ventral pale.

Male. Head wider than the pronotum, eyes large and prominent, antennae stout, extending beyond the apices of the elytra, second and third segments sub-equal in length, intermediate segments about four times as long as wide. Pronotum transverse, margins rather widely beaded, sides nearly straight and parallel from the oblique anterior angles to the basal angles which are obtusely rounded, the anterior margin nearly straight.

Female. Differs from the male in having smaller eyes, the antennae shorter, the intermediate segments about two and a half times as long as wide. The last abdominal segment is dark blackish brown.

²Biol. Centr.-Am. Coleopt., 3(2):80. 1881.

³Trans. Ent. Soc. London, 1915:53.

Male terminal modifications. Sixth ventral feebly narrowed apically, very deeply widely emarginate, the base of the emargination rounded; seventh ventral narrow, elongate, widely forked nearly to the base of the visible portion of the segment, apices of the seventh ventral not extending as far as the apices of the sixth; last dorsal not produced, truncate apically. Figs. 1 & 2.

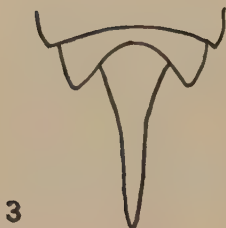
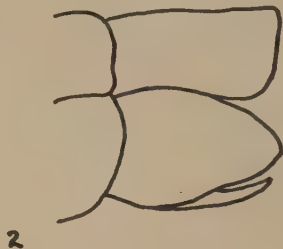
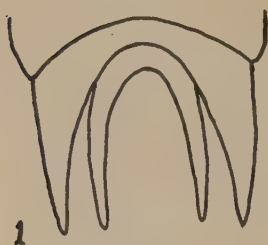


Fig. 1. Terminal abdominal segments of male of *Malthodes greeni* Fender, ventral view. Fig. 2. Same in profile. Fig. 3. Terminal abdominal segments of male of *Malthodes alexanderi* Fender, ventral view. Fig. 4. Same in profile.

Holotype: male, LUCEDALE, MISS., IV-21-30, collected by H. Dietrich, in the author's collection. *Allotype:* female, Lucedale, Miss., IV-18-30, collected by H. Dietrich, in the author's collection. *Paratypes:* (7) same data as allotype; (5) same data as holotype; (1) type locality, collected V-8-30 by H. Dietrich.

This fine species is dedicated to Mr. J. W. Green, one of our most ardent coleopterists. The male terminal modifications are entirely different from those of any other known North American species. It may be readily separated from any of our described species by its very deeply forked seventh ventral, a characteristic that is approached by no other species.

Malthodes alexanderi Fender, new species

Dark piceous, antennae black; mandibles, margins of pronotum, bases of trochanters, apices of coxae, last ventral and apex of last dorsal pale. Pubescence cinereous. Length 3 mm.

Male. Eyes prominent; head wider than thorax, rather finely granulate punctate; antennae as long as the body, segments two to four distinctly increasing in length, the intermediate segments five times as long as wide. Pronotum transverse, anterior angles rounded, the sides slightly concave, converging to the hind angles which are abruptly rounded, marginal bead slightly thicker at the anterior angles, surface finely sparsely punctate. Elytra reaching to the apex of the fifth abdominal segment, finely sparsely punctured basally, becoming slightly rugose apically.

Female. Unknown.

Male terminal modifications. Last dorsal somewhat produced, the apex truncate; sixth ventral deeply broadly emarginate, the base of the emargination evenly rounded; seventh ventral elongate, wide at base, narrowing rapidly to basal two fifths then feebly narrowed to apex which is sharply rounded; seventh ventral in profile obliquely ascending from basal two fifths; just above seventh ventral an obliquely ascending, straight, spatula shaped process which in profile appears triangularly clavate; a shorter spatulate shaped process with the sides rather strongly down-curved just below last dorsal. Figs. 3 & 4.

Holotype: male, WONDERLD TRAIL, MT. RAINIER, WASH., 5800 feet, VIII-1-47, collected by C. P. Alexander, in the author's collection.

Malthodes alexanderi runs to *M. magister* Fall in Fall's key to California *Malthodes*⁴. From that species it may readily be separated by its more elongate seventh ventral and the presence of the additional processes. It give me great pleasure to dedicate this species to its collector who has added many fine specimens to my collection.

⁴Ann. Ent. Soc. Am., Vol. XII, No. 1, pp. 31-42, 1919.

OVIPOSITION AND HATCHING OF *PSELLIOPUS SPINICOLLIS* CHAMPION

(Heteroptera: Reduviidae)

By J. W. TILDEN

San Jose State College, California

A single female of this species was taken on Page Mill Road, Santa Clara County, California, about three miles from Stanford University. This specimen was retained alive for forty-nine days and considerable information concerning it was obtained.

It was found to feed readily on aphids. In feeding, the reduviid moved slowly and deliberately, apparently locating the prey by sight. Intended prey was first touched lightly with the raptorial forelegs, and then seized, and brought into position for the rostrum to be inserted. The rostrum was inserted but a short distance into the tissues of the abdomen of the aphid, and the body juices were then removed rapidly, the body of the prey shrinking in the process. In no case was the aphid seen to struggle, nor was it lifted above the surface of the stem. Of what the usual food of *Pselliopus* may consist is not known, but in the laboratory only aphids were accepted although many other sorts of insects were offered.

No eggs were laid until after feeding. Eggs were laid in small groups, several in one day, with a delay of several days between ovipositions. The first eggs hatched before the second group was laid, but thereafter, the periods between oviposition were shorter. The female was captured on June 12, 1947. Five eggs were laid on June 17, five on July 6, four on July 10, five on July 21, five on July 24, and two on July 31, on the same day that the female died. Thus thirty eggs were laid during the forty-nine day period that the female was kept in the laboratory.

All of these eggs save two were placed on the under surface of the cloth closure of the container in which the insect was kept. These two were placed on the under surface of leaves. It would seem that this species normally oviposits on the lower surface of leaves, but since the female was attracted to light, it spent a great deal of time at the top of the vial, which may account for the tendency to oviposit there. This positive phototropism was

apparent when the container was placed against a dark wall, for under such circumstances the insect invariably sought the most highly lighted side of the container.

The eggs are flask-shaped, dark brown, smooth and glossy, with the circlet of chorionic processes ("seminal cups" of Leuckart) white. The operculum is elevated and digitiform, of a beige color in freshly laid eggs. The eggs measure 1.5 mm. in length, and the diameter of the thickest part of the base is 0.5 mm. The eggs are not laid one in contact with the other, but are well separated, although several are deposited near each other, at a distance of several millimeters. The exochorion seems to be slight, although it serves to attach the egg to a surface. The chorion is tough and resistant.

At hatching, the cap or operculum opens like a lid but remains attached at one point. The nymph has cephalic spines which may serve as an egg-breaker, but it is difficult to establish this point by observation. It was concluded that they do play a part in eclosion. All appendages are tightly appressed at first. Slow movements in the vertical plane free long setae which catch on the edges of the opercular opening and prevent any loss of forward movement. When the nymph is nearly out of the egg, the appendages are worked free, manipulated until they are firm, and then the nymph drops to the surface below. None climbed upward. All dropped to the bottom of the container. The newly hatched nymphs are yellow with red eyes. This darkens to amber with dark eyes, and the appendages are ringed with black. There are eight lateral spines, very long and conspicuous, the posterior two pair larger. There are numerous other setae over the whole body.

After eclosion, the embryonic membranes protrude from the egg, giving an immediate clue as to whether or not an egg has hatched.

The young were fed on aphids, and their behavior was curious. First instar nymphs of *Pselliopus* were scarcely so big as some of the aphids, and were wary about approaching the prey. If the aphid moved, the reduviid nymphs were startled and retreated, at times losing balance and falling from the branch. They would then crawl painstakingly up again, and continue to search carefully until another aphid was found. In several instances, young

nymphs were observed to insert the rostrum before the prey was seized with the raptorial legs. Occasionally, the nymph failed to subdue the aphid on the first attempt, and either tried again or retreated to another part of the plant.

It was hoped to rear adults from these nymphs, but a necessary absence from the laboratory caused them to die from lack of food while they were in the third instar. However, it was found that the hatching time of the eggs was in most cases thirteen days, and that the eggs which were laid on June 17 hatched on June 30. The resulting nymphs underwent ecdysis on July 14, and again on July 31. The first instar was thus fourteen days in length and of seventeen days duration for the second instar. It is of interest to note that all of the eggs seemed fertile although the female was solitary during her captivity. Fertilization prior to capture sufficed. Thus it seems evident that repeated copulation is not necessary in this species. All eggs hatched except those that were preserved for study.

The specific determination is through the kindness of Dr. R. I. Sailer.

OBITUARY NOTICE

William Brodbeck Herms

William Brodbeck Herms, Professor Emeritus of Parasitology, University of California, died suddenly on May 9, 1949, at the age of 72 years and 7 months. He was born in Portsmouth, Ohio, on September 22, 1876. In 1902 he received his B.Sc. from Baldwin Wallace College, followed in 1935 by an Honorary D.Sc.

Among his many activities he will be best remembered as a leader in the field of Medical Entomology through his teaching, texts and research. It is a tribute to his boundless enthusiasm for his work that shortly before his death he had placed in the hands of the publishers an entirely revised manuscript of his valuable book, "Medical Entomology."

His passing is deeply regretted, not only by those associates and friends who knew him personally but by scientists familiar with his work throughout the world.—D. P. FURMAN.

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